SEQUENCE LISTING

<110> Goodwin, Raymond G.
       Smith, Craig A.

<120> 4-1BB Polypeptides and DNA Encoding 4-1BB Polypeptides

<130> 2801-C

<140> US 08/910,449
<141> 1997-08-05

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Gln His Thr Leu Asp Val Glu Asp Thr Ala Asp Ala Arg His Pro Ala
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ggt act tcg tgc ccc tcg gat gcg gcg ctc ctc aga gat acc ggg ctc   154
Gly Thr Ser Cys Pro Ser Asp Ala Ala Leu Leu Arg Asp Thr Gly Leu
     20   25   30

ctc gcg gac gct gcg ctc ctc tca gat act gtg cgc ccc aca aat gcc   202
Leu Ala Asp Ala Ala Leu Leu Ser Asp Thr Val Arg Pro Thr Asn Ala
35   40   45   50

gcg ctc ccc acg gat gct gcc tac cct gcg gtt aat gtt cgg gat cgc   250
Ala Leu Pro Thr Asp Ala Ala Tyr Pro Ala Val Asn Val Arg Asp Arg
                 55   60   65

gag gcc gcg tgg ccg cct gca ctg aac ttc tgt tcc cgc cac cca aag   298
Glu Ala Ala Trp Pro Pro Ala Leu Asn Phe Cys Ser Arg His Pro Lys
             70   75   80

ctc tat ggc cta gtc gct ttg gtt ttg ctg ctt ctg atc gcc gcc tgt   346
Leu Tyr Gly Leu Val Ala Leu Val Leu Leu Leu Leu Ile Ala Ala Cys
             85   90   95

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gtt cct atc ttc acc cgc acc gag cct cgg cca gcg ctc aca atc acc          394
Val Pro Ile Phe Thr Arg Thr Glu Pro Arg Pro Ala Leu Thr Ile Thr
    100                     105                 110

acc tcg ccc aac ctg ggt acc cga gag aat aat gca gac cag gtc acc          442
Thr Ser Pro Asn Leu Gly Thr Arg Glu Asn Asn Ala Asp Gln Val Thr
115                 120                 125                 130

cct gtt tcc cac att ggc tgc ccc aac act aca caa cag ggc tct cct          490
Pro Val Ser His Ile Gly Cys Pro Asn Thr Thr Gln Gln Gly Ser Pro
            135                 140                 145

gtg ttc gcc aag cta ctg gct aaa aac caa gca tcg ttg tgc aat aca          538
Val Phe Ala Lys Leu Leu Ala Lys Asn Gln Ala Ser Leu Cys Asn Thr
            150                 155                 160

act ctg aac tgg cac agc caa gat gga gct ggg agc tca tac cta tct          586
Thr Leu Asn Trp His Ser Gln Asp Gly Ala Gly Ser Ser Tyr Leu Ser
        165                 170                 175

caa ggt ctg agg tac gaa gaa gac aaa aag gag ttg gtg gta gac agt          634
Gln Gly Leu Arg Tyr Glu Glu Asp Lys Lys Glu Leu Val Val Asp Ser
    180                 185                 190

ccc ggg ctc tac tac gta ttt ttg gaa ctg aag ctc agt cca aca ttc          682
Pro Gly Leu Tyr Tyr Val Phe Leu Glu Leu Lys Leu Ser Pro Thr Phe
195                 200                 205                 210

aca aac aca ggc cac aag gtg cag ggc tgg gtc tct ctt gtt ttg caa          730
Thr Asn Thr Gly His Lys Val Gln Gly Trp Val Ser Leu Val Leu Gln
            215                 220                 225

gca aag cct cag gta gat gac ttt gac aac ttg gcc ctg aca gtg gaa          778
Ala Lys Pro Gln Val Asp Asp Phe Asp Asn Leu Ala Leu Thr Val Glu
            230                 235                 240

ctg ttc cct tgc tcc atg gag aac aag tta gtg gac cgt tcc tgg agt          826
Leu Phe Pro Cys Ser Met Glu Asn Lys Leu Val Asp Arg Ser Trp Ser
            245                 250                 255

caa ctg ttg ctc ctg aag gct ggc cac cgc ctc agt gtg ggt ctg agg          874
Gln Leu Leu Leu Leu Lys Ala Gly His Arg Leu Ser Val Gly Leu Arg
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gct tat ctg cat gga gcc cag gat gca tac aga gac tgg gag ctg tct          922
Ala Tyr Leu His Gly Ala Gln Asp Ala Tyr Arg Asp Trp Glu Leu Ser
275                 280                 285                 290

tat ccc aac acc acc agc ttt gga ctc ttt ctt gtg aaa ccc gac aac          970
Tyr Pro Asn Thr Thr Ser Phe Gly Leu Phe Leu Val Lys Pro Asp Asn
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cca tgg gaa tgagaactat ccttcttgtg actcctagtt gctaagtcct               1019
Pro Trp Glu


caagctgcta tgttttatgg ggtctgagca ggggtccctt ccatgacttt ctcttgtctt     1079

taactggact tggtatttat tctgagcata gctcagacaa gactttatat aattcactag     1139
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Asn Ala Ala Leu Pro Thr Asp Ala Ala Tyr Pro Ala Val Asn Val Arg
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Asp Arg Glu Ala Ala Trp Pro Pro Ala Leu Asn Phe Cys Ser Arg His
65   70   75   80

Pro Lys Leu Tyr Gly Leu Val Ala Leu Val Leu Leu Leu Ile Ala
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Ala Cys Val Pro Ile Phe Thr Arg Thr Glu Pro Arg Pro Ala Leu Thr
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Ile Thr Thr Ser Pro Asn Leu Gly Thr Arg Glu Asn Asn Ala Asp Gln
            115   120   125

Val Thr Pro Val Ser His Ile Gly Cys Pro Asn Thr Thr Gln Gln Gly
    130   135   140

Ser Pro Val Phe Ala Lys Leu Leu Ala Lys Asn Gln Ala Ser Leu Cys
145   150   155   160

Asn Thr Thr Leu Asn Trp His Ser Gln Asp Gly Ala Gly Ser Ser Tyr
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Leu Ser Gln Gly Leu Arg Tyr Glu Glu Asp Lys Lys Glu Leu Val Val
                180   185   190

Asp Ser Pro Gly Leu Tyr Tyr Val Phe Leu Glu Leu Lys Leu Ser Pro
            195   200   205

Thr Phe Thr Asn Thr Gly His Lys Val Gln Gly Trp Val Ser Leu Val
    210   215   220

Leu Gln Ala Lys Pro Gln Val Asp Asp Phe Asp Asn Leu Ala Leu Thr
225   230   235   240

Val Glu Leu Phe Pro Cys Ser Met Glu Asn Lys Leu Val Asp Arg Ser
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Trp Ser Gln Leu Leu Leu Leu Lys Ala Gly His Arg Leu Ser Val Gly

3

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                 260                      265                      270
    Leu Arg Ala Tyr Leu His Gly Ala Gln Asp Ala Tyr Arg Asp Trp Glu
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    Leu Ser Tyr Pro Asn Thr Thr Ser Phe Gly Leu Phe Leu Val Lys Pro
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    Asp Asn Pro Trp Glu
    305


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    cct ccc gcg ccc cgc gct cgc gcc tgc cgc gta ctg cct tgg gcc ctg      96
    Pro Pro Ala Pro Arg Ala Arg Ala Cys Arg Val Leu Pro Trp Ala Leu
                    20                  25                  30

    gtc gcg ggg ctg ctg ctg ctg ctg ctc gct gcc gcc tgc gcc gtc       144
    Val Ala Gly Leu Leu Leu Leu Leu Leu Ala Ala Ala Cys Ala Val
                35                  40                  45

    ttc ctc gcc tgc ccc tgg gcc gtg tcc ggg gct cgc gcc tcg ccc ggc     192
    Phe Leu Ala Cys Pro Trp Ala Val Ser Gly Ala Arg Ala Ser Pro Gly
            50                  55                  60

    tcc gcg gcc agc ccg aga ctc cgc gag ggt ccc gag ctt tcg ccc gac     240
    Ser Ala Ala Ser Pro Arg Leu Arg Glu Gly Pro Glu Leu Ser Pro Asp
        65                  70                  75

    gat ccc gcc ggc ctc ttg gac ctg cgg cag ggc atg ttt gcg cag ctg     288
    Asp Pro Ala Gly Leu Leu Asp Leu Arg Gln Gly Met Phe Ala Gln Leu
    80                  85                  90                  95

    gtg gcc caa aat gtt ctg ctg atc gat ggg ccc ctg agc tgg tac agt     336
    Val Ala Gln Asn Val Leu Leu Ile Asp Gly Pro Leu Ser Trp Tyr Ser
                    100                 105                 110

    gac cca ggc ctg gca ggc gtg tcc ctg acg ggg ggc ctg agc tac aaa     384
    Asp Pro Gly Leu Ala Gly Val Ser Leu Thr Gly Gly Leu Ser Tyr Lys
                    115                 120                 125

    gag gac acg aag gag ctg gtg gtg gcc aag gct gga gtc tac tat gtc     432
    Glu Asp Thr Lys Glu Leu Val Val Ala Lys Ala Gly Val Tyr Tyr Val
                    130                 135                 140

    ttc ttt caa cta gag ctg cgg cgc gtg gtg gcc ggc gag ggc tca ggc     480
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4

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·Phe Phe Gln Leu Glu Leu Arg Arg Val Val Ala Gly Glu Gly Ser Gly
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tcc gtt tca ctt gcg ctg cac ctg cag cca ctg cgc tct gct gct ggg      528
Ser Val Ser Leu Ala Leu His Leu Gln Pro Leu Arg Ser Ala Ala Gly
160                 165                 170                 175

gcc gcc gcc ctg gct ttg acc gtg gac ctg cca ccc gcc tcc tcc gag      576
Ala Ala Ala Leu Ala Leu Thr Val Asp Leu Pro Pro Ala Ser Ser Glu
                180                 185                 190

gct cgg aac tcg gcc ttc ggt ttc cag ggc cgc ttg ctg cac ctg agt      624
Ala Arg Asn Ser Ala Phe Gly Phe Gln Gly Arg Leu Leu His Leu Ser
                195                 200                 205

gcc ggc cag cgc ctg ggc gtc cat ctt cac act gag gcc agg gca cgc      672
Ala Gly Gln Arg Leu Gly Val His Leu His Thr Glu Ala Arg Ala Arg
        210                 215                 220

cat gcc tgg cag ctt acc cag ggc gcc aca gtc ttg gga ctc ttc cgg      720
His Ala Trp Gln Leu Thr Gln Gly Ala Thr Val Leu Gly Leu Phe Arg
        225                 230                 235

gtg acc ccc gaa atc cca gcc gga ctc cct tca ccg agg tcg gaa          765
Val Thr Pro Glu Ile Pro Ala Gly Leu Pro Ser Pro Arg Ser Glu
240                 245                 250

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gagacccctg gtgctgggtc cctgctgctt tctctacctc aaggggcttg gcaggggtcc      885

ctgctgctga cctccccttg ggaccctcc tcacccactc cttccccaag ttggaccttg      945

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gaaacatcta gaaatagact gaaagaaaat ctgagttatg gtaatacgtg aggaatttaa      1305

agactcatcc ccagcctcca cctcctgtgt gatacttggg ggctagcttt tttctttctt      1365

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Ala Gly Leu Leu Leu Leu Leu Leu Leu Ala Ala Ala Cys Ala Val Phe
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Leu Ala Cys Pro Trp Ala Val Ser Gly Ala Arg Ala Ser Pro Gly Ser
        50                  55                  60

Ala Ala Ser Pro Arg Leu Arg Glu Gly Pro Glu Leu Ser Pro Asp Asp
65                  70                  75                  80

Pro Ala Gly Leu Leu Asp Leu Arg Gln Gly Met Phe Ala Gln Leu Val
                85                  90                  95

Ala Gln Asn Val Leu Leu Ile Asp Gly Pro Leu Ser Trp Tyr Ser Asp
            100                 105                 110

Pro Gly Leu Ala Gly Val Ser Leu Thr Gly Gly Leu Ser Tyr Lys Glu
        115                 120                 125

Asp Thr Lys Glu Leu Val Val Ala Lys Ala Gly Val Tyr Tyr Val Phe
        130                 135                 140

Phe Gln Leu Glu Leu Arg Arg Val Val Ala Gly Glu Gly Ser Gly Ser
145                 150                 155                 160

Val Ser Leu Ala Leu His Leu Gln Pro Leu Arg Ser Ala Ala Gly Ala
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Ala Ala Leu Ala Leu Thr Val Asp Leu Pro Pro Ala Ser Ser Glu Ala
            180                 185                 190

Arg Asn Ser Ala Phe Gly Phe Gln Gly Arg Leu Leu His Leu Ser Ala
        195                 200                 205

Gly Gln Arg Leu Gly Val His Leu His Thr Glu Ala Arg Ala Arg His
    210                 215                 220

Ala Trp Gln Leu Thr Gln Gly Ala Thr Val Leu Gly Leu Phe Arg Val
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ggc tgt gag aag gtg gga gcc gtg cag aac tcc tgt gat aac tgt cag          96
Gly Cys Glu Lys Val Gly Ala Val Gln Asn Ser Cys Asp Asn Cys Gln
        -5              -1  1                   5

cct ggt act ttc tgc aga aaa tac aat cca gtc tgc aag agc tgc cct         144
Pro Gly Thr Phe Cys Arg Lys Tyr Asn Pro Val Cys Lys Ser Cys Pro
10                  15                  20                  25

cca agt acc ttc tcc agc ata ggt gga cag ccg aac tgt aac atc tgc         192
Pro Ser Thr Phe Ser Ser Ile Gly Gly Gln Pro Asn Cys Asn Ile Cys
                30                  35                  40

aga gtg tgt gca ggc tat ttc agg ttc aag aag ttt tgc tcc tct acc         240
Arg Val Cys Ala Gly Tyr Phe Arg Phe Lys Lys Phe Cys Ser Ser Thr
                45                  50                  55

cac aac gcg gag tgt gag tgc att gaa gga ttc cat tgc ttg ggg cca         288
His Asn Ala Glu Cys Glu Cys Ile Glu Gly Phe His Cys Leu Gly Pro
            60                  65                  70

cag tgc acc aga tgt gaa aag gac tgc agg cct ggc cag gag cta acg         336
Gln Cys Thr Arg Cys Glu Lys Asp Cys Arg Pro Gly Gln Glu Leu Thr
        75                  80                  85

aag cag ggt tgc aaa acc tgt agc ttg gga aca ttt aat gac cag aac         384
Lys Gln Gly Cys Lys Thr Cys Ser Leu Gly Thr Phe Asn Asp Gln Asn
90                  95                  100                 105

ggt act ggc gtc tgt cga ccc tgg acg aac tgc tct cta gac gga agg         432
Gly Thr Gly Val Cys Arg Pro Trp Thr Asn Cys Ser Leu Asp Gly Arg
                110                 115                 120

tct gtg ctt aag acc ggg acc acg gag aag gac gtg gtg tgt gga ccc         480
Ser Val Leu Lys Thr Gly Thr Thr Glu Lys Asp Val Val Cys Gly Pro
                125                 130                 135

cct gtg gtg agc ttc tct ccc agt acc acc att tct gtg act cca gag         528
Pro Val Val Ser Phe Ser Pro Ser Thr Thr Ile Ser Val Thr Pro Glu
            140                 145                 150

gga gga cca gga ggg cac tcc ttg cag gtc ctt acc ttg ttc ctg gcg         576
Gly Gly Pro Gly Gly His Ser Leu Gln Val Leu Thr Leu Phe Leu Ala
    155                 160                 165

ctg aca tcg gct ttg ctg ctg gcc ctg atc ttc att act ctc ctg ttc         624
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Leu Thr Ser Ala Leu Leu Leu Ala Leu Ile Phe Ile Thr Leu Leu Phe
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Ser Val Leu Lys Trp Ile Arg Lys Lys Phe Pro His Ile Phe Lys Gln
            190   195   200

cca ttt aag aag acc act gga gca gct caa gag gaa gat gct tgt agc   720
Pro Phe Lys Lys Thr Thr Gly Ala Ala Gln Glu Glu Asp Ala Cys Ser
            205   210   215

tgc cga tgt cca cag gaa gaa gaa gga gga gga gga ggc tat gag ctg   768
Cys Arg Cys Pro Gln Glu Glu Glu Gly Gly Gly Gly Gly Tyr Glu Leu
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Pro Gly Thr Phe Cys Arg Lys Tyr Asn Pro Val Cys Lys Ser Cys Pro
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Pro Ser Thr Phe Ser Ser Ile Gly Gly Gln Pro Asn Cys Asn Ile Cys
            30   35   40

Arg Val Cys Ala Gly Tyr Phe Arg Phe Lys Lys Phe Cys Ser Ser Thr
        45   50   55

His Asn Ala Glu Cys Glu Cys Ile Glu Gly Phe His Cys Leu Gly Pro
        60   65   70

Gln Cys Thr Arg Cys Glu Lys Asp Cys Arg Pro Gly Gln Glu Leu Thr
    75   80   85

Lys Gln Gly Cys Lys Thr Cys Ser Leu Gly Thr Phe Asn Asp Gln Asn
90   95   100   105

Gly Thr Gly Val Cys Arg Pro Trp Thr Asn Cys Ser Leu Asp Gly Arg
            110   115   120

Ser Val Leu Lys Thr Gly Thr Thr Glu Lys Asp Val Val Cys Gly Pro
            125   130   135

Pro Val Val Ser Phe Ser Pro Ser Thr Thr Ile Ser Val Thr Pro Glu
        140   145   150

Gly Gly Pro Gly Gly His Ser Leu Gln Val Leu Thr Leu Phe Leu Ala
    155   160   165

Leu Thr Ser Ala Leu Leu Leu Ala Leu Ile Phe Ile Thr Leu Leu Phe
170   175   180   185

8

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Ser Val Leu Lys Trp Ile Arg Lys Lys Phe Pro His Ile Phe Lys Gln
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Pro Phe Lys Lys Thr Thr Gly Ala Ala Gln Glu Glu Asp Ala Cys Ser
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Cys Arg Cys Pro Gln Glu Glu Glu Gly Gly Gly Gly Gly Tyr Glu Leu
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atg gga aac agc tgt tac aac ata gta gcc act ctg ttg ctg gtc ctc      167
Met Gly Asn Ser Cys Tyr Asn Ile Val Ala Thr Leu Leu Leu Val Leu
              -20                 -15                 -10

aac ttt gag agg aca aga tca ttg cag gat cct tgt agt aac tgc cca      215
Asn Phe Glu Arg Thr Arg Ser Leu Gln Asp Pro Cys Ser Asn Cys Pro
          -5                 -1  1                  5

gct ggt aca ttc tgt gat aat aac agg aat cag att tgc agt ccc tgt      263
Ala Gly Thr Phe Cys Asp Asn Asn Arg Asn Gln Ile Cys Ser Pro Cys
10                 15                 20                 25

cct cca aat agt ttc tcc agc gca ggt gga caa agg acc tgt gac ata      311
Pro Pro Asn Ser Phe Ser Ser Ala Gly Gly Gln Arg Thr Cys Asp Ile
              30                 35                 40

tgc agg cag tgt aaa ggt gtt ttc agg acc agg aag gag tgt tcc tcc      359
Cys Arg Gln Cys Lys Gly Val Phe Arg Thr Arg Lys Glu Cys Ser Ser
              45                 50                 55

acc agc aat gca gag tgt gac tgc act cca ggg ttt cac tgc ctg ggg      407
Thr Ser Asn Ala Glu Cys Asp Cys Thr Pro Gly Phe His Cys Leu Gly
              60                 65                 70

gca gga tgc agc atg tgt gaa cag gat tgt aaa caa ggt caa gaa ctg      455
Ala Gly Cys Ser Met Cys Glu Gln Asp Cys Lys Gln Gly Gln Glu Leu
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9

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aca aaa aaa ggt tgt aaa gac tgt tgc ttt ggg aca ttt aac gat cag    503
Thr Lys Lys Gly Cys Lys Asp Cys Cys Phe Gly Thr Phe Asn Asp Gln
90              95              100             105

aaa cgt ggc atc tgt cga ccc tgg aca aac tgt tct ttg gat gga aag    551
Lys Arg Gly Ile Cys Arg Pro Trp Thr Asn Cys Ser Leu Asp Gly Lys
            110             115             120

tct gtg ctt gtg aat ggg acg aag gag agg gac gtg gtc tgt gga cca    599
Ser Val Leu Val Asn Gly Thr Lys Glu Arg Asp Val Val Cys Gly Pro
            125             130             135

tct cca gcc gac ctc tct ccg gga gca tcc tct gtg acc ccg cct gcc    647
Ser Pro Ala Asp Leu Ser Pro Gly Ala Ser Ser Val Thr Pro Pro Ala
        140             145             150

cct gcg aga gag cca gga cac tct ccg cag atc atc tcc ttc ttt ctt    695
Pro Ala Arg Glu Pro Gly His Ser Pro Gln Ile Ile Ser Phe Phe Leu
        155             160             165

gcg ctg acg tcg act gcg ttg ctc ttc ctg ctg ttc ttc ctc acg ctc    743
Ala Leu Thr Ser Thr Ala Leu Leu Phe Leu Leu Phe Phe Leu Thr Leu
170             175             180             185

cgt ttc tct gtt gtt aaa cgg ggc aga aag aaa ctc ctg tat ata ttc    791
Arg Phe Ser Val Val Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe
            190             195             200

aaa caa cca ttt atg aga cca gta caa act act caa gag gaa gat ggc    839
Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly
            205             210             215

tgt agc tgc cga ttt cca gaa gaa gaa gaa gga gga tgt gaa ctg        884
Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
        220             225             230

tgaaatggaa gtcaataggg ctgttgggac tttcttgaaa agaagcaagg aaatatgagt    944

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ccaacacacg ttcttttcta aatgccaatg agttggcctt taaaaatgca ccactttttt   1064

tttttttttt gacagggtct cactctgtca cccaggctgg agtgcagtgg caccaccatg   1124

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gctggaacta caaggaaggg ccaccacacc tgactaactt ttttgttttt tgtttggtaa   1244

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Ala Gly Thr Phe Cys Asp Asn Asn Arg Asn Gln Ile Cys Ser Pro Cys
10              15              20                      25

Pro Pro Asn Ser Phe Ser Ser Ala Gly Gly Gln Arg Thr Cys Asp Ile
            30              35                      40

Cys Arg Gln Cys Lys Gly Val Phe Arg Thr Arg Lys Glu Cys Ser Ser
            45              50                      55

Thr Ser Asn Ala Glu Cys Asp Cys Thr Pro Gly Phe His Cys Leu Gly
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Ala Gly Cys Ser Met Cys Glu Gln Asp Cys Lys Gln Gly Gln Glu Leu
    75              80                      85

Thr Lys Lys Gly Cys Lys Asp Cys Cys Phe Gly Thr Phe Asn Asp Gln
90              95                      100                     105

Lys Arg Gly Ile Cys Arg Pro Trp Thr Asn Cys Ser Leu Asp Gly Lys
            110             115                     120

Ser Val Leu Val Asn Gly Thr Lys Glu Arg Asp Val Val Cys Gly Pro
            125             130                     135

Ser Pro Ala Asp Leu Ser Pro Gly Ala Ser Ser Val Thr Pro Pro Ala
        140             145                     150

Pro Ala Arg Glu Pro Gly His Ser Pro Gln Ile Ile Ser Phe Phe Leu
    155             160                     165

Ala Leu Thr Ser Thr Ala Leu Leu Phe Leu Leu Phe Phe Leu Thr Leu
170             175                     180                     185

Arg Phe Ser Val Val Lys Arg Gly Arg Lys Lys Leu Leu Tyr Ile Phe
            190             195                     200

Lys Gln Pro Phe Met Arg Pro Val Gln Thr Thr Gln Glu Glu Asp Gly
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Cys Ser Cys Arg Phe Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
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  1               5                   10                  15

tct tgt gac aaa act cac aca tgc cca ccg tgc cca gca cct gaa ctc       97
Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
            20                  25                  30

ctg ggg gga ccg tca gtc ttc ctc ttc ccc cca aaa ccc aag gac acc      145
Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
        35                  40                  45

ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac gtg      193
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
    50                  55                  60

agc cac gaa gac cct gag gtc aag ttc aac tgg tac gtg gac ggc gtg      241
Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
65                  70                  75                  80

gag gtg cat aat gcc aag aca aag ccg cgg gag gag cag tac aac agc      289
Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
                85                  90                  95

acg tac cgg gtg gtc agc gtc ctc acc gtc ctg cac cag gac tgg ctg      337
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
            100                 105                 110

aat ggc aag gac tac aag tgc aag gtc tcc aac aaa gcc ctc cca gcc      385
Asn Gly Lys Asp Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
        115                 120                 125

ccc atg cag aaa acc atc tcc aaa gcc aaa ggg cag ccc cga gaa cca      433
Pro Met Gln Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
    130                 135                 140

cag gtg tac acc ctg ccc cca tcc cgg gat gag ctg acc aag aac cag      481
Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
145                 150                 155                 160

gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agg cac atc gcc      529
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Arg His Ile Ala
                165                 170                 175

gtg gag tgg gag agc aat ggg cag ccg gag aac aac tac aag acc acg      577
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
            180                 185                 190

cct ccc gtg ctg gac tcc gac ggc tcc ttc ttc ctc tac agc aag ctc      625
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
        195                 200                 205

acc gtg gac aag agc agg tgg cag cag ggg aac gtc ttc tca tgc tcc      673
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
    210                 215                 220

gtg atg cat gag gct ctg cac aac cac tac acg cag aag agc ctc tcc      721
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
225                 230                 235                 240
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Leu Ser Pro Gly Lys
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                20   25   30

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            35   40   45

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
        50   55   60

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
65   70   75   80

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
                85   90   95

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
            100   105   110

Asn Gly Lys Asp Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
        115   120   125

Pro Met Gln Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
    130   135   140

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
145   150   155   160

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Arg His Ile Ala
                165   170   175

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
            180   185   190

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
    195   200   205

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
    210   215   220

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
225   230   235   240

Leu Ser Pro Gly Lys
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14

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